

# Identification of Patients with Hepatitis C Virus Infection in New Haven County Primary Care Practices

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## Abstract

**Background:** Primary care providers (PCPs) must identify persons at risk for hepatitis C virus (HCV) infection, test them correctly, refer to subspecialists, and use published guidelines. The objectives of this study were to describe HCV practices of New Haven County PCPs. **Study:** All 652 PCPs in New Haven County, Connecticut, were surveyed to determine practices related to hepatitis C, including risk factor ascertainment, testing routines, use of published guidelines, and referral practices. **Results:** Of 181 eligible respondents, 143 (79%) were internal medicine physicians and 38 (21%) were family practitioners. Eighty-four PCPs (46%) routinely asked about a history of blood transfusion, and 112 (62%) routinely asked about a history of injection drug use (IDU). Most PCPs would test current or past IDU (91% versus 83%, respectively), persons transfused prior to 1992 (79%), health care workers with a history of a needle stick accident (88%), and a child born to an HCV-infected mother (76%). PCPs frequently referred patients with hepatitis C to gastroenterologists. Most PCPs (76%) were familiar with available hepatitis C testing guidelines. **Conclusions:** Most PCPs test for HCV infection appropriately, but many do not elicit risk factor histories that could identify such persons. More effective training with emphasis on eliciting a history of pertinent risk factors is needed.

**Key Words:** Hepatitis C detection—Liver disease—Primary care.

An estimated 2.7 million persons in the United States are infected with hepatitis C virus (HCV).<sup>1</sup> The factors most strongly associated with HCV infection include illegal drug use and high-risk sexual behavior.<sup>1</sup> Because most of people infected are younger than 50 years of age, the burden of disease associated with HCV may increase over the next several decades as these individuals reach an age at which

the complications of chronic liver disease are more likely to occur.<sup>2</sup> Improvements in the efficacy of therapies that may prevent these complications increase the potential benefit of early identification of infected individuals.

Because HCV infection is frequently asymptomatic, recognition of patients who might benefit from treatment will require primary care providers (PCPs) to identify persons at risk for infection, test them correctly, and make appropriate referrals to subspecialists. Guidelines for the prevention and control of HCV infection and HCV-related chronic liver disease and for the management of patients with hepatitis C were formulated by the Centers for Disease Control and Prevention (CDC) and the National Institutes of Health, the latter having been recently updated.<sup>3,4</sup> These publications represent an important consensus approach to providing practitioners with guidance on how to identify and manage patients with hepatitis C. However, PCP use of these resources and their practice routines with respect to these factors have not been well characterized.

In light of the need to better understand how PCPs (i.e., family practitioners and internists) approach identification of patients with HCV infection, we conducted a mailed survey of PCPs in New Haven County, Connecticut. The goal of this survey was to examine practice routines with respect to ascertainment of selected exposures associated with HCV infection, testing, resource utilization, and subspecialist referral.

## MATERIAL AND METHODS

The 652 physicians listed in insurance and state Medicaid provider directories as practicing family practice (FP) or adult internal medicine (IM) in New Haven County (1998 adult population, 608,802) at the inception of the study in May 1999 were sent three mailings, ≈1 month apart. Physicians who reported practicing primary care for at least 8 hours per week were considered eligible.

Using the CDC recommendations as a guide,<sup>3</sup> we designed brief patient profiles to determine the frequency with which PCPs elicit histories of blood transfusion and injection drug use (IDU), known HCV exposures. The patient profiles included hypothetical history of hospitalization, trauma, surgery, or childbirth. Respondents were also given the option of reporting that a history of transfusion was elicited from all patients or under no circumstance. The elicitation of a history of IDU was also assessed using hypothetical patient profiles. These profiles included history of incarceration, body tattoo or piercing, or sexually transmitted disease.

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Again, respondents were given the option of reporting that a history of IDU was elicited from all patients or under no circumstance. We designed additional clinical profiles to determine those patient characteristics that would prompt testing for HCV infection: these profiles included current or remote illicit drug use or IDU, blood transfusion prior to or after 1992, body tattoo or piercing, alcohol use, infected sexual or household contact, child of infected mother, veteran or needle stick injury. We also assessed factors that would prompt referral to a gastroenterologist or hepatologist using a similar format of clinical profiles: these profiles included abnormal liver test results on one or more occasions and in the setting of IDU, alcohol use, and a positive test for hepatitis B or C. Last, we assessed familiarity and use of the CDC recommendations using a scale ranging from 1 ("hadn't heard of it") to 4 ("routinely use it for patient management"). A copy of the survey is available from the authors.

For the purpose of analysis, respondents were divided into two groups based on their primary care specialty (FP versus IM). Where applicable, the Mantel-Haenszel  $\chi^2$  was used to evaluate differences between groups. Approval for this study was obtained from the appropriate institutional review board(s).

## RESULTS

Of the 652 PCPs to whom surveys were mailed, 269 (41%) responded. Among these respondents, 88 (33%) were excluded for the following reasons: 55 were IM subspecialists; 23 stated that they were not PCPs; 2 did not practice primary care for at least 8 hours per week; 4 returned the questionnaire blank; and 4 had retired. Of the 181 (28% overall response rate) eligible respondents, 143 (79%) were IM physicians and 38 (21%) were FP physicians. Respondents were similar to nonrespondents with respect to the median number of years in practice, specialty (IM versus FP), the proportion practicing in solo versus group practices, and the percent in urban practices, defined as being within the city limits of New Haven, the largest city in the county (Table 1). Moreover, the respondent PCP group was similar to the overall U.S. PCP population in terms of the number of years in practice, specialty, proportion in solo versus group practices, and board certification status.<sup>5</sup>

### Identification of Exposures

#### Blood Transfusions

Eighty-four (46%) of the 181 respondents reported that they routinely ask all patients about a history of blood trans-

fusion, while 18 (10%) reported that they do not routinely ask any patient about prior transfusions (Figure 1). The remaining 79 respondents (44%) reported that they ask about a transfusion history only in one or more hypothetical situations, such as patients with hepatitis B or C (39%), patients who had undergone surgery (17%), or patients who had been hospitalized for trauma (20%). FP physicians were significantly less likely than IM physicians to ask patients about a transfusion history (21% versus 7%, respectively;  $P = 0.01$ ).

#### IDU

Most respondents (62%) reported routinely asking all patients about a history of IDU, while 10 (5%) did not routinely elicit IDU histories (Figure 1). The remaining 59 respondents (33%) reported asking about an IDU history in one or more hypothetical situations, such as anti-HCV-positive patients (30%) or those with a history of a sexually transmitted disease (22%), incarceration (14%), or tattoos or body piercing (14%). No statistically significant differences between FP and IM physicians in ascertainment of a history of IDU were identified.

### Testing for HCV Infection

Table 2 illustrates risk factors and behaviors, organized according to CDC testing guidelines, and the percentage of respondents who would test for hepatitis C based on them. Many respondents reported that they would test patients for HCV infection who were known current or former IDUs (91% versus 83%, respectively) or current or former users of noninjected drugs (59% versus 49%, respectively). FP physicians were less likely than IM physicians to test patients who were former IDUs (68% versus 87%, respectively;  $P = 0.008$ ). Most respondents reported testing patients who received a blood transfusion before 1992 (79%), but 45% reported that they would also test patients who received a blood transfusion after 1992. Most respondents reported testing patients who were spouses or sexual partners of an HCV-infected person (89%), children born to infected mothers (76%), or household (nonsexual) contacts of an HCV-infected person (55%). A total of 32% and 33%, respectively, would test persons who had a body piercing or tattoo. Health care workers with a history of a needle stick injury would be tested by 88% of respondents, but some respondents also reported testing health care or public safety workers without a history of such exposures (26%) or persons with a history of military service (8%). Other than the testing of former IDUs mentioned previously, no differences in testing practices between FP and IM physicians were observed.

#### Subspecialty Referral

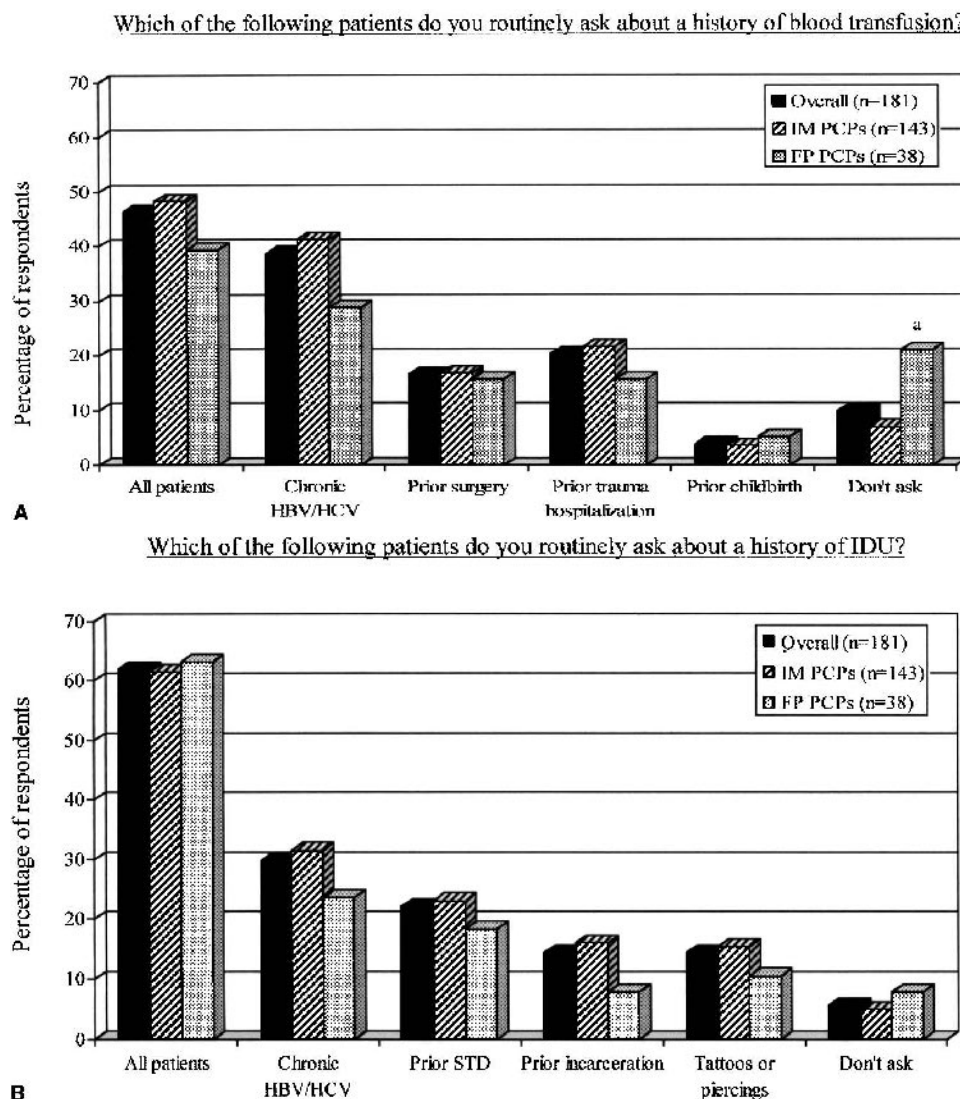
Most PCPs would refer patients who had anti-HCV in the setting of abnormal liver test results (172 [95%]) (Table 3). In contrast, 99 respondents (55%;  $P = 0.001$ ) reported

**TABLE 1. Professional characteristics of PCPs: Respondents versus nonrespondents: New Haven County, CT, 1999**

Characteristic	Respondents (n = 181)	Nonrespondents (n = 383)
Median years in practice (range)	16 (2–56)	19.5 (4–53)
Percent internal medicine PCPs	79.0	82.8
Percent in group practice	72.1	78.7
Percent urban practitioners*	34.8	31.0

\*Defined as practicing primarily within the city limits of New Haven. The data presented demonstrate that the respondents were similar to nonrespondents.

**FIG. 1.** Elicitation of patient transfusion and intravenous drug use (IDU) histories by primary care providers (PCPs): New Haven County, Connecticut, 1999. <sup>a</sup> $P < 0.01$  when compared with internal medicine (IM) PCPs. FP, family practice; HBV, hepatitis B virus infection; HCV, hepatitis C virus infection; STD, sexually transmitted disease.



that they would refer anti-HCV-positive patients with normal liver test results. Subspecialty referral is infrequent, even in the setting of more than one abnormal liver test finding if in the absence of known HCV. No statistically significant differences between FP and IM physicians were identified with respect to subspecialty referral practices.

#### *Familiarity with Published Guidelines*

Most respondents reported not having heard of the CDC recommendations (37 [20%]) or having heard of them but not using them (57 [32%]). Fifty respondents (28%) reported having read them and using them occasionally, and only 30 (17%) reported that they routinely used them for patient management (Figure 2). FP physicians were less likely to use the CDC guidelines than were IM physicians (5% versus 20%, respectively;  $P < 0.05$ ).

## DISCUSSION

PCPs can play an important role in identifying patients with hepatitis C by eliciting histories of exposures associated with infection, testing patients with recognized exposures, and appropriately referring patients to subspecialists for further evaluation and management. Identification of patients with hepatitis C also provides PCPs with the opportunity to counsel patients to prevent further harm to the liver and to avoid transmitting HCV to others.

The results of our survey indicate, in an objective and quantitative way, that many New Haven County PCPs do not routinely ask patients about exposures associated with HCV infection. Notwithstanding this, most PCPs report testing practices consistent with CDC guidelines despite the relatively low reported rate of use. However, many PCPs also report testing patients with exposures that have not



**TABLE 2.** Patient risk factors/behaviors that would prompt testing for hepatitis C by primary care physicians: New Haven County, CT, 1999

Hypothetical patient clinical profile	Percentage of respondents		
	Overall (n = 181)	IM PCPs (n = 143)	FP PCPs (n = 38)
Current IDU*	91	91	90
Prior <sup>1</sup> IDU*	83	87	68*
Blood transfusion prior to 1992†	79	80	74
Child born to HCV+ mother†	76	75	79
HCW with needlestick history†	88	88	87
Current drug use (non-IDU)‡	59	59	55
Prior <sup>1</sup> drug use (non-IDU)‡	49	51	40
HCV+ spouse or sexual partner‡	89	90	87
Body piercing (excluding ears)‡	32	31	37
Tattoo‡	33	31	40
Blood transfusion after 1992§	45	44	50
Current heavy alcohol use <sup>2</sup> §	21	19	29
Prior <sup>3</sup> heavy alcohol use <sup>2</sup> §	16	15	21
HCV+ household member§	55	55	58
Health care or safety worker <sup>4</sup> §	26	26	26
Veteran§	8	8	8

<sup>1</sup>More than 10 years ago.

<sup>2</sup>More than four drinks per day.

<sup>3</sup>Abstinent for more than 6 months.

<sup>4</sup>Without any other identified exposure.

\* $P = 0.008$ , versus IM PCPs

†CDC advises testing for Hepatitis C in this situation.

‡CDC advises that testing for Hepatitis C is of uncertain value in this situation.

§CDC does not advise testing for Hepatitis C in this situation.

IM PCPs indicates internal medicine primary care physicians; FP PCPs, family practice primary care physicians; IDU, injecting drug use; HCV+, hepatitis C virus positive.

Based on the Centers for Disease Control and Prevention publication Recommendations for Prevention and Control of Hepatitis C Virus (HCV) Infection and HCV-Related Chronic Disease. *MMWR* 1998;47:RR-19.<sup>3</sup>

These data represent the percentage of respondents who would test for hepatitis C given various hypothetical patient clinical profiles. PCPs' responses are organized according to CDC testing guidelines.

been consistently associated with an increased risk of HCV infection in published studies, such as tattoo, body piercing, and household contact. Although certain practices between internists and family practitioners appeared to differ, these differences may not be clinically relevant due to the small number of FP respondents in comparison with IM respondents; a study with a larger number of FP physicians would be required to validate these differences.

Studies indicate that IDU is the single most important risk factor for HCV infection, and this exposure has accounted for a substantial proportion of HCV infections during past decades.<sup>1,6,7</sup> An estimated 5% of the U.S. population reports a history of prior IDU, and an estimated 0.5% are currently injecting.<sup>3</sup> Thus, primary care practices are likely to include current and former IDUs. Similarly, patients who have undergone procedures requiring blood

transfusions are likely to continue to receive medical care and thus be seen in primary care practices. Patients are unlikely to volunteer these exposures, and therefore can best be identified by specific questioning during routine history taking in PCP practices. The results of our study indicate that a considerable proportion of PCPs are failing to elicit exposure histories that would identify patients for whom diagnostic testing is indicated.

The observation that PCPs infrequently ask about high-risk social behaviors has been made previously. Using standardized patient cases to assess preventive screening skills of practicing primary care physicians, Ramsey et al.<sup>8</sup> showed that physicians, particularly family practitioners, do not routinely ask patients about non-IDU. Although these researchers did not investigate if physicians asked about IDU, it is reasonable to assume that a history of this behavior would be obtained no more frequently.

Many surveyed PCPs reported testing patients with exposures not associated with HCV infection and for whom testing is not recommended in the CDC published guidelines, such as transfusion after 1992, health care workers without recognized needle stick injuries, household non-sexual contacts, and persons with body piercings or tattoos. In a related study by Shehab et al.,<sup>9</sup> PCPs in a large HMO setting had a high level of awareness of conventional risk factors but were similarly misinformed about risks associated with certain other exposures, such as receiving a blood transfusion in 1994.

We found that most New Haven County PCPs would refer HCV-positive patients with abnormal liver test results for subspecialty care. This finding appears to be in contradistinction to a report by Nicklin et al.<sup>10</sup> who found sub-

**TABLE 3.** Referral practices of primary care physicians for various clinical scenarios: percentage of respondents who would refer a patient given various clinical scenarios: New Haven County, CT, 1999

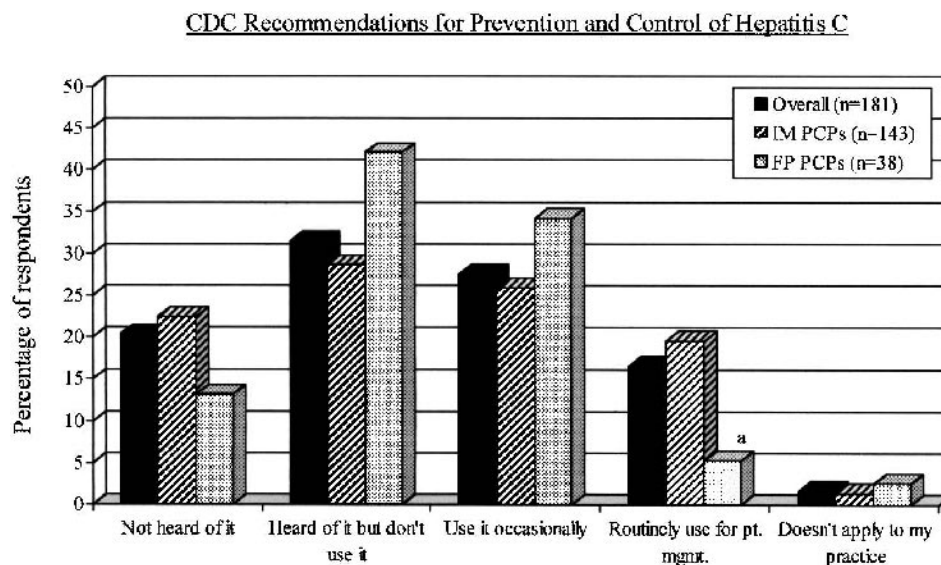
Patient clinical profile	Percentage of respondents		
	Overall (n = 181)	IM PCPs (n = 143)	FP PCPs (n = 38)
One abnormal liver test	1	1	3
>1 abnormal LT	31	32	26
Anti-HCV positive and abnormal LTs	95	95	95
Anti-HCV positive and normal LTs	55*	52	66

\*Difference in percent referring for positive serologies and normal vs. abnormal LTs,  $P = 0.001$ .

IM PCPs indicates internal medicine primary care physicians; FP PCPs, family practice primary care physicians; LT, liver test; anti-HCV, hepatitis C antibody.

The data that most PCPs refer patients with anti-HCV and abnormal liver tests; however, in the absence of an abnormal liver test, referral is much less likely. Similarly, the finding of more than one abnormal liver test leads to referral infrequently.

**FIG. 2.** Awareness and use of Centers for Disease Control and Prevention's recommendations for prevention and control of hepatitis C by primary care providers (PCPs): New Haven County, Connecticut, 1999. <sup>a</sup> $P < 0.05$ , when compared with internal medicine (IM) PCPs. FP, family practice; pt. mgmt., patient management.



stantial disparity between reported versus actual behaviors with respect to identification, management, and referral of patients with HCV infection among primary care physicians. In light of this, we reviewed the outpatient medical records of 61 patients with suspected chronic liver disease who were cared for by New Haven County PCPs; we found that fewer than one half of the patients identified by the PCPs as having HCV infection were actually referred to gastroenterologists (authors' unpublished data). These observations highlight the inherent difficulty in interpreting self-reported behaviors. The need for better PCP awareness of risk factors and screening, as well as appropriate testing procedures, is apparent.

This study has several important limitations. Most important were the relatively low response rate (28% overall) and the small geographic region with its PCP sample as the only studied provider population. Despite New Haven County PCP characteristics that compare favorably with those of PCPs nationwide, these factors limit the ability to generalize our results. In addition, the clinical scenarios that were outlined as representative for PCPs were broad in scope. In particular, these scenarios did not consider other factors that may affect decision making by PCPs, such as other available demographic or clinical information or their subjective assessment. Thus, a primary care physician's decisions offered on the basis of the provided scenarios may not always reflect their decision making on an individual patient basis. Moreover, the CDC guidelines may not have been widely circulated to surveyed PCPs, limiting their value as a benchmark for judging HCV-related clinical behaviors of PCPs.

In summary, our study suggests that New Haven County PCPs do not routinely elicit histories of risk factors for HCV

infection from their patients. As a result, because these risk factors may not be volunteered, patients in primary care practices with hepatitis C may not be identified. In addition, PCPs had misconceptions regarding the magnitude of risk associated with certain exposures; many reported testing patients in situations in which it was not necessary. Although limited by the small sample of PCPs, it is possible that HCV-related behaviors of PCPs nationwide may be similar to those of our group. Thus, these findings suggest that to identify the potentially large number of patients with unrecognized hepatitis C in primary care practices, more effective training among all PCPs, with emphasis on eliciting a history of pertinent risk factors and appropriate testing, is needed.

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